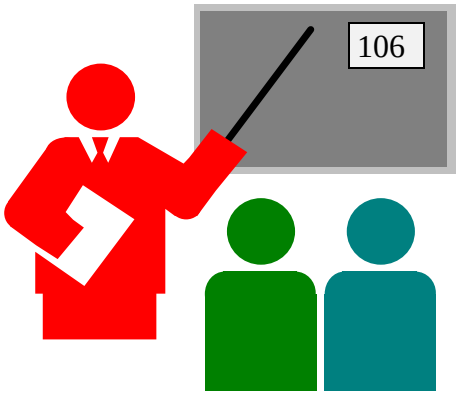
BALANCING TIP # 106

C D International, Inc.
www.balancingweightsonline.com

This article is compliments of Balancing USA, Inc.
www.balancingusa.com

A COMMON SENSE CHECKLIST FOR FIELD BALANCING



Dynamic Balancing of rotating equipment in-place is commonly referred to as Field Balancing. The Common Sense Checklist has been prepared as an organized guide to follow when Field Balancing. It includes what to do before, during and after balancing. It is presented as a tool for those who know how to field balance - not to teach balancing.

Dynamic Balancing of rotating equipment in-place is commonly referred to as Field Balancing. It differs from the balancing done in a Balancing Machine for several reasons. First, when balancing a rotor in-place, it can be operated as a complete assembly under actual operating conditions. Second, the acceptable level of unbalance is based upon a vibration tolerance rather than a standard unbalance tolerance such as an ounce inch or a gram inch. As a general rule, field balancing does not replace balancing in a balancing machine, but is used to "fine tune" the system for acceptable performance when possible.

The Common Sense Checklist has been prepared as an organized guide to follow when field balancing. It includes the preparation, the actual balancing and the things to do after balancing.

This Checklist has been prepared as an aid for those who know how to field balance, not to teach the procedure.

CHECKING BALANCING EQUIPMENT

- ☐ Has the instrument been checked to make sure it works and is the battery charged ?
- ☐ Are all accessories present and in good condition ?
  Transducers(at least 2), photocell, strobe light or laser, cables, magnetic holders, extension cord, etc.
- ☐ Has the instrument been calibrated in the last 12 months ?
- ☐ Is any special equipment required ?

  Oscilloscopes, extra long cables, two way radio, special adapters to monitors, calculator, computer, scales, weights, ear plugs, etc.

ENVIRONMENT

- □ Is the machine in a hazardous area requiring special precautions and is the equipment satisfactory for the application? (Explosive, chemical, radioactive, other).

- □ Is the machine inside or outside, in extremely high temperatures or humidity requiring special procedures or equipment? Is the equipment and procedure available?

MACHINE INFORMATION

- □ When did the vibration problem start?

- □ Has anything been done to the machine recently? (Alignment, bearing replaced, etc.)

- □ Is there any past history available?

- □ Is the problem really unbalance ? Has a vibration analysis been done to determine this?
  (Vibration is at 1 x RPM in horizontal and/or vertical direction. Phase between horizontal and vertical readings is approximately 90 degrees. Overall Vibration is approximately equal to vibration at 1 x RPM.)

- □ Is the unit to be balanced clean and free of buildup ? Inspect to determine if cleaning is required.

BALANCING

- □ Mount transducers in the direction of highest amplitude on bearing caps (Suggestion- Use the same direction for all transducers).

- □ Establish a phase reference system for the strobe light, photocell or laser

.

- □ Take original vibration readings. Are the readings stable ?

- □ Is the machine at normal operating conditions ? If not, remember to check machine after balancing under normal conditions.

- □ Store original readings within the instrument or record on paper. If at all possible, compare horizontal to vertical readings and record both amplitude and phase.

- □ Start and stop the machine a second time if possible to double check to see if readings are repeatable.

- □ Add trial (calibration) weight accurately to one plane. Watch for stable reading at operating RPM. Store or write down readings. Look for significant amplitude or phase change. 30 degree phase change or 30 % amplitude change or both (both is better).

SPECIAL NOTE: Make sure that the calibration weight is securely attached and is of a size and shape that will allow the calibration runs to be performed safely.

- □ Stop rotor, remove the trial weight and add to second plane. Watch for stable

reading at operating RPM. Store or write down readings. Look for significant amplitude or phase change. 30 degree phase change or 30 % amplitude change or both (both is better).

□ Review answer. Should I
- convert to static/ couple correction ?
- remove second trial weight ? Some programs allow for weight to remain on rotor.
- select or reposition planes for correction weights ? Some programs/instruments allow for this.

□ Add correction weights. Remember to be accurate on phase. A 7 1/2 degree error in positioning weight means a correction of only 8 to 1.

□ Make no more than 3 correction runs. If vibration is not reduced to an acceptable level, look for reason.

□ Some reasons to consider if things don't go according to plan:
- machine responds in a non linear fashion. Re-calibrate instrument using trial weights at the last lower level of unbalance.
- may be trying to balance near a resonance. Put filter out (overall vibration) and shut machine off. Watch for sudden drop off in vibration level or rapid phase change.
- am I using the instrument right ? On proper scale, filter tuned properly, transducers mounted properly, etc.
- Reality check. What assumptions were made that may not be valid ?
- Know who to call if help is needed.

FINAL CHECKS

□ If things went according to plan, allow machine to reach operating conditions and recheck vibration levels.

□ Make sure that all safety guards and safety signs are returned to their proper location and installed properly.